

**MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT
MD0068284**

REVIEW OF PRINCE GEORGE'S COUNTY'S 2009 ANNUAL REPORT

Prince George's County was reissued a National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system discharge permit (MD0068284) on October 13, 2004. NPDES regulations require permit conditions that effectively prohibit non-stormwater discharges and reduce the discharge of pollutants to the "maximum extent practicable." For each year of the County's permit, an annual report is required to help assess the County's stormwater program. In order to provide continuity of reporting between permit terms, the County is to submit its annual reports by mid-January each year. The following is a review of Prince George's County's annual report that was submitted to the Maryland Department of the Environment (MDE) on March 30, 2010.

Permit Administration

Prince George's County is required to identify key administrative and technical personnel responsible for permit compliance. The County submitted an updated contact list and organizational charts with its annual report. No major changes were reported. Any additional or future changes should be immediately reported to MDE.

Legal Authority

Prince George's County is required to maintain legal authority to perform the activities described in 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i) and permit MD0068284. In May 1999, the County submitted certification by its attorney that adequate legal authority exists to control the quality as well as quantity of water discharged through the County storm sewer system. In the event that any provision of its legal authority is found to be invalid, the County will need to make the necessary changes to maintain adequate legal authority.

Source Identification

Prince George's County is required to identify sources of pollutants in stormwater runoff and link these sources to specific water quality impacts on a watershed-by-watershed basis. To demonstrate this capability, the County is required to submit information regarding its storm drain system, urban best management practices (BMPs), impervious surfaces, monitoring locations, and watershed restoration locations in geographic information system (GIS) format with associated tables as required in Part IV of the permit. This information is to be updated annually and submitted on databases in a format consistent with Attachment A of the permit.

Traditionally, Prince George's County has had difficulty reporting NPDES data. In order to address data reporting problems, the County's Office of Information Technology and Communications in partnership with PowerSolv, Inc., has developed an automated data tracking

and management system that integrates permit and license applications, NPDES, and GIS information. This new system is designed to automatically extract data from the County's Permit and License Application Tracking System (PLATS) on a continuous basis. This allows stormwater project status to be linked with property coverage. Additionally, the new system is supposed to allow staff to enter data across programmatic boundaries and should rectify any data inaccuracies between departments.

The County reported that it maintains a storm drain inventory in GIS format and that location features (e.g., outfalls, inlets) are routinely updated. A review of the submitted storm drain inventory data finds that 186 outfalls have been added during the reporting period. Additionally, the drainage area for 573 outfalls has been added. This brings the total to 7,382 outfalls that have been identified with 967 having their associated drainage area delineated. The County reported that it can identify the origins of discharges through the use of its storm drain inventory, high-resolution aerial imagery, and countywide two-foot topography mapping. As a result, the County is requesting that this alternative methodology be accepted in lieu of establishing GIS data for specific outfall drainage areas. While this task is onerous at best, all NPDES municipal stormwater community members have been required to delineate the drainage area for major outfalls. Consistent reporting amongs all jurisdictions will be of the utmost importance to effectively gauge progress toward meeting local and Chesapeake Bay Total Maximum Daily Loads (TMDLs).

The County is required to submit stormwater management facility construction completion data on MDE's Urban BMP Database. The County submitted current information regarding 1,191 BMPs that includes 151 new facilities that were added during 2009. Drainage areas have been delineated for 827.

The County is also required to delineate impervious areas. The County's analysis indicates that there are 37,578 acres of impervious surfaces (e.g., transportation and building footprint) out of a total 318,853 acres in Prince George's County. After excluding areas such as State and federal facilities and roads, Bowie, etc., there are 22,020 impervious acres. This established 2,202 impervious acres as the County's restoration treatment goal. Additionally, the County reported that 25,547 acres are controlled by stormwater BMPs with 4,547 acres being impervious surfaces. The County should consider segmenting these facilities by date of completion (e.g., pre/post 2000) to determine what portion of its BMPs are considered to be treating stormwater to the "maximum extent practicable."

The County is required to submit the locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the *2000 Maryland Stormwater Design Manual*. The data were submitted on a database in a format consistent with Appendix A of the permit. However, stormwater BMP data fields were noticeably vacuous.

Lastly, basic information regarding Capital Improvement Program project (watershed restoration projects) status was submitted. The information submitted indicates that seven projects were constructed during the reporting period. These projects are reported to have treated 29.9 acres of impervious surface. Prince George's County's data reporting efforts have greatly improved from previous years. As discussed above, additional effort needs to be put forth regarding outfall drainage area delineation.

Management Program

Prince George's County is required to conduct preventative maintenance inspections of all stormwater management facilities at least on a triennial basis. Additionally, documentation identifying the facilities inspected, the number of maintenance inspections, follow-up inspections, and the enforcement action(s) used to ensure compliance are to be submitted in the County's annual report.

According to initial permit application data, there are more than 10,000 stormwater management facilities in Prince George's County. The County reported that the Department of Public Works and Transportation (DPW&T) is responsible for inspecting and maintaining 456 publicly owned stormwater management ponds within Prince George's County. In Prince George's County, "public" stormwater management facilities include those conveying or treating runoff from more than one property or sites that are zoned residential. The County reported that inspection and maintenance occurred at 228 public facilities in 2009. Reporting of information specific to facility condition and actual maintenance was not submitted and continues to be a shortcoming.

In 2008, the County contracted Greenhorn and O'Mara to develop a standard methodology for the inspection of private stormwater management facilities. During 2009, an inspection manual was completed and training was provided to County staff. Subsequently, 114 facilities were inspected with approximately 81% requiring corrective action and reinspection. The County has indicated that educational outreach will encompass their initial action regarding enforcement. Efforts put forth during the last year indicate that the County is moving toward permit compliance. However, the success of the County's efforts will be gauged by obtaining compliance at all stormwater management facilities. As this program evolves, the County will need to include inspection guidance for the myriad practices for low-impact development (LID) and environmental site design (ESD).

The County is required to maintain an acceptable erosion and sediment control program and address any needed program improvements identified during MDE's evaluation of the County's application for the delegation of erosion and sediment control enforcement authority. Delegation to Prince George's County has been limited to one year due to concerns that included poor initial installation of sediment controls, premature removal of controls, and a lack of timely stabilization. This delegation was contingent upon the County making needed program improvements. MDE has conducted numerous field visits during 2008 and 2009 to monitor progress toward implementing solutions to address program deficiencies and to insure that outstanding violations are addressed. While some progress had been made, shortcomings in Prince George's County's erosion and sediment control program persist. The adverse water quality impacts associated with ineffective erosion and sediment control implementation may be negating any benefits derived by the County's watershed restoration efforts.

The County is also required to conduct responsible personnel certification classes to educate construction site personnel regarding erosion and sediment control compliance. Program activity is to be recorded on MDE's "green card" database and submitted with annual reports. The County reported that it conducted three training sessions during 2009.

Additionally, information regarding earth disturbances exceeding one acre or more is to be reported quarterly and is to be specific to the permitting activity for the three months preceding

submittal. Grading permit information has been routinely submitted during the reporting period. However, site location information remains inadequate. The County needs to report this information in Maryland grid coordinate (NAD 83 meters) format.

The County is required to implement an illicit discharge detection and elimination program. At a minimum, the County is to field screen at least 150 outfalls annually, survey commercial and industrial areas for discovering and eliminating pollutant sources, and maintain a program to address illegal dumping and spills. Inspection and enforcement efforts are to ensure that all discharges to and from the municipal storm drain system that are not composed entirely of stormwater are either permitted by MDE or eliminated. Significant discharges are to be reported to MDE for enforcement and/or permitting.

The investigation and enforcement of non-stormwater discharges occurs as a result of complaints and, more proactively, as part of the County's Comprehensive Community Cleanup Program (CCCP). During the reporting period, 158 outfalls within 21 communities were screened as part of the CCCP efforts. Dry-weather flow was not observed at any of the outfalls. Therefore, none of the outfalls were tested for chemical constituents. Considering that dry-weather flows are rarely detected as a result of field-screening during the CCCP, the County should target its field efforts to commercial and industrial areas with known adverse water quality impacts (e.g., Lower Beaverdam Creek watershed).

Field screening efforts are to be documented on MDE's Illicit Discharge Detection and Elimination Database. Information was submitted for the screened outfalls. Data regarding the dimension or type of outfall were absent for approximately ten-percent of the records. The County needs to improve its reporting efforts in this regard. Similarly, information regarding the routine survey of commercial and industrial areas for discovering and eliminating pollutant sources was not reported. The photographs below (Figures 74 and 75 in the *Anacostia Trash TMDL-Related Baseline Conditions Monitoring (June 2008 – July 2009)*) aptly illustrates the need for enhanced field presence and enforcement by the County.



The County reported that it responded to 45 water quality complaints. Twelve were found to be unrelated to stormwater, 11 were corrected immediately, 16 were referred to other agencies [e.g., Washington Suburban Sanitary Commission (WSSC), DPW&T, Department of Environmental Resources (DER), Zoning], and the status of the remaining 5 was not reported. While the County

appears to respond to complaints and illicit discharges through inspection, the status of enforcement for the referred complaints has not been reported. The County needs to ensure that

illicit discharges are eliminated and report the outcome of its referrals. Additionally, the County's Health Department's Office of Engineering investigated 160 water quality concerns during the reporting period. The Health Department investigated 117 sewer overflows or line breaks that were reported to by WSSC. The remaining 43 investigations involved private septic system failures. Lastly, the County Fire/Emergency Medical Services Department's Hazardous Materials Division responded to 308 calls during the reporting period. The majority of responses were to address combustible liquids, flammable gases, and poison gases.

The County is required to identify all County-owned and municipal facilities requiring NPDES stormwater general permit coverage and submit Notices of Intent (NOI) to MDE for each. Additionally, the status of pollution prevention plan development and implementation is to be reported annually. The County has identified eight of its 242 owned and operated facilities as requiring discharge permits. These eight facilities have been permitted under MDE's *General Discharge Permit for Storm Water Associated with Industrial Activities*. Coverage under MDE's general permit is predicated upon developing and implementing a pollution prevention plan. The County reported that it has developed and is implementing a Countywide Pollution Prevention Strategy to reduce stormwater impacts from County facilities. The strategy includes management level awareness and compliance training. Significant achievements in 2009 included the training of 11 facility managers and 460 County employees and facility contractors. Pollution prevention plans have been developed and the status of activities reported for each facility.

There are 22 Phase II municipalities within Prince George's County. In 2006, the County surveyed these municipalities regarding their pollution prevention and good house-keeping efforts. Results of the surveys indicated that the majority of municipalities conducted activities that would require NPDES stormwater general permit coverage. However, actual site visits in 2008 indicated that many municipalities share resources or contract services that would otherwise require permitting. As a result of the site visits, it was determined that 12 municipal facilities require permitting. The County reported that the 12 facilities requiring permit coverage have submitted NOIs to MDE. Additionally, the County reported that good house-keeping practices have been initiated at most of the facilities and that pollution prevention plans are being developed for the City of Laurel and Town of Cheverly facilities. These plans will serve as templates for the remaining facilities.

Previously, the County reported that it had identified maintenance issues at County and municipal used oil and antifreeze collection sites. These issues (e.g., leaks and spills) pose significant risk to local water quality. During 2009, improvements were reported at some of the facilities and continued progress is anticipated as additional awareness and technical assistance occur.

The County is required to develop and implement a plan to reduce pollutants associated with its road maintenance activities. At a minimum, annual progress reports are to be submitted that document inlet cleaning, street sweeping, roadside vegetation management, and winter weather deicing activities. Storm drain inlets within subdivisions are inspected and cleaned as part of the

County's CCCP. Residential subdivision and municipal inlets are cleaned an average of once every two years as well. As a result of these efforts, 16,300 storm drain inlets were cleaned

during the reporting period.

The County reported that all residential subdivision streets are swept annually and that selected arterial and collector roadways are swept twice each year. Approximately 924 curb miles were swept and the County reported impervious surface treatment as 1,121 acres. Temporal consideration needs to be given when estimating impervious area treatment resulting from street sweeping. Additionally, litter is collected along County roadways with scheduling based on historical collection data. During 2009, approximately 4,980 tons of debris and solid waste were removed from County roadways as a result of these efforts.

Roadside vegetation maintenance is done mostly by mowing with herbicide use restricted to guardrail areas only. The County also reported that the Office of Highway Maintenance (OHM) of its DPW&T routinely calibrates deicing equipment to prevent excessive application of materials. Pavement temperature sensors have also been installed on roadways throughout the County. These sensors allow for effective decision making and better timing of material application.

The County is required to implement a public education and outreach program to reduce stormwater pollutants. Outreach efforts are to be integrated with all aspects of the County's NPDES activities. These efforts are to be documented and summarized in each annual report. At a minimum, the County is to establish and publicize a compliance hotline for the public reporting of suspected illicit discharges, illegal dumping, and spills.

The County reported that it continues to operate a water pollution hotline (95-CLEAN) and email service (DERCares) for public reporting of water pollution problems. The email service resulted in the investigation of 38 water related inquiries during 2009. The County is also required to provide information regarding various water quality issues to the general public and regulated community. The County continues to implement a diverse public outreach program that focuses on pollution prevention. Recent activities include participating in numerous public and community events and disseminating information regarding pollution prevention, water conservation, household hazardous waste, lawn care, recycling, car care, and private well and septic management.

As recommended during the last review, the County has initiated outreach efforts regarding pet waste management. This effort included the dissemination of information via direct mail to approximately 4,000 licensed pet owners in the Laurel Lakes watershed. Brochures, posters, wallet cards, interpretive signs, and waste kits were also developed to address pollution. Similar efforts were initiated to address car washing, fertilizer use, and trash within the Laurel Lakes area. The County reported that it will be monitoring the results of these efforts and tailor successful components into a countywide effort. While the County continues to do an excellent job with the development and dissemination of public outreach material, an assessment regarding changes in public awareness and behavior needs to be made. For example, watershed and community cleanups continue to yield large amounts of trash and debris indicating that enhanced audience targeting or a message change may be appropriate.

Prince George's County has successfully implemented many of the stormwater management program elements required by its NPDES permit. While certain program components are considered to be strong (e.g., public outreach), erosion and sediment control program

deficiencies remain to be addressed and the County needs to initiate surveillance of industrial and commercial

land uses for discovering and eliminating pollutant sources. Better water quality will be difficult to achieve until fundamental programs such as erosion and sediment control and illicit connection detection and elimination are administered more effectively.

Watershed Assessment and Planning

Prince George's County is required to conduct a systematic assessment of water quality within its 41 identified watersheds. The overall goal is to have all land area in Prince George's County covered by a specific action plan to address the water quality problems identified. At a minimum, the County is to perform a detailed watershed assessment for one County watershed during each year of the permit term.

As NPDES stormwater program implementation has evolved, there has been a move toward conducting assessments and planning based upon Maryland's hierarchical twelve-digit sub-basins. With the exception of the Anacostia River watershed, the County is converting its assessment, planning, and management activities for the 41 watersheds to Maryland's 12-digit watershed scale. This change in scale increased the number of subwatershed management units to 72 and these will correspond with TMDL and State water quality planning efforts. The reduction in unit area should also allow the County to better gauge the effectiveness of BMP restoration success.

Prince George's County is best described as having two major drainage basins: the Patuxent River and Potomac River basins. The Patuxent basin contains five Maryland eight-digit watersheds with a total of 42 twelve-digit subwatersheds that encompass 51 percent of the land area in the County. The Potomac basin contains seven Maryland eight-digit watersheds with a total of 30 twelve-digit subwatersheds that encompass 49 percent of the land area in the County.

During 2009, stream corridor assessments (SCAs) were completed for Western Branch, Henson Creek (Potomac River Upper Tidal), and Piscataway Creek watersheds. The Bear Branch SCA was completed in 2008. Overall, SCAs have been completed for approximately two-thirds of the County's land area. Through SCAs, the County is able to assess the present environmental condition of stream networks, identify problems such as pipe outfalls, erosion sites, lack of buffers, fish passage blockages, sewer outfalls, or unusual conditions, and rank watershed restoration opportunities.

Additionally, a trash monitoring project to establish baseline conditions for the Maryland portion of the Anacostia River was completed in 2009. This was a cooperative effort with MDE, Metropolitan Washington Council of Governments (MWCOC), Maryland-National Capital Park and Planning Commission (M-NCPPC), Montgomery County, and the Beltsville Agricultural Research Center (BARC). The results will be used by MDE to develop a trash TMDL for the Anacostia watershed. Twenty-two sites were monitored representing four site types (i.e., streams, storm drain outfalls, roadways, and a trash netting system.) Information was submitted regarding site location, land use, and the number and weight of various categories of trash.

Previously, Prince George's County completed a five-year (1999-2003) jurisdiction-wide biological monitoring and assessment program. The monitoring program included the collection

and analyses of benthic macroinvertebrate data, the assessment of physical habitat quality, and an analysis of selected water chemistry parameters. The narrative site ratings for physical habitat were “non-supporting” and the benthic index of biological integrity was “fair” to “very poor.” The County reported that it is proposing to resume countywide random sampling in 2010. It is unclear how the past and proposed monitoring will be used for planning purposes.

As for planning, Watershed Restoration Action Strategies (WRASs) have been completed for portions of the Upper Patuxent River, Western Branch, and Anacostia River watersheds. WRASs are the end product of Maryland’s Unified Watershed Assessment process that was developed by the Maryland Department of Natural Resources (MDNR) in 1998 as a result of the federal Clean Water Action Plan (CWAP) initiative. The information from MDNR’s technical watershed assessment, local knowledge from stakeholder involvement, and leadership from local government are combined to provide a consensus-based strategy to steer watershed restoration. The strategy identifies priorities, opportunities, concerns, and challenges as well as potential mitigation, restoration, and protection sites.

The WRASs developed in Prince George’s County focused on implementing Low Impact Development (LID) techniques within developed areas. The County reported that it will be unable to demonstrate significant progress in reaching the impervious treatment goals established in its permit using the WRAS strategy. As a result, the County is currently upgrading existing GIS-based tools to support analysis and decision making for stormwater planning and design at the watershed scale. Specifically, the watershed planning currently conducted through the WRAS will be enhanced through the creation of Watershed Restoration Plans (WRP) that will set goals, identify steps to achieve those goals, and provide an implementation schedule and monitoring plan. The WRP decision making process will be supported by use of the Center for Watershed Protection’s (CWP) Watershed Treatment Model (WTM) to calculate pollutant loads under existing and proposed land use management scenarios.

Currently, watershed restoration planning is underway for the Bear Branch, Piscataway Creek, and Western Branch watersheds. A draft plan for Bear Branch was completed in 2009 while the latter two are scheduled for completion in 2010 and 2011, respectively. Targeted restoration efforts are based on impervious cover analysis, stream corridor assessment, stormwater retrofit inventory, and modeling via the WTM using the County’s monitoring results discussed below. During 2009, a subwatershed action plan (SWAP), baseline condition report, and project inventory were completed for all 15 subwatersheds in the Anacostia River watershed. The next step in the planning process for the Anacostia River watershed is a feasibility study. The initial cost estimate for project implementation is \$8.3 million resulting in treatment of 8,590 impervious acres.

The County continues to make a substantial effort to document watershed conditions. Similarly, progress is being made regarding development of restoration plans. Ultimately, the success of the County’s assessment and planning efforts will be gauged by implementation of projects and improved water quality.

Watershed Restoration

Prince George's County is required to implement the practices identified in its watershed plans (e.g., WRAS, WRP, SWAP, etc.). The goal is to maximize the water quality in a single watershed, or combination of watersheds, using efforts that are definable and the effects of which are measurable. At a minimum, the County is to complete the implementation of those restoration efforts that were identified and initiated during the previous permit term to restore ten percent of the County's impervious surface area. The watershed or combinations of watersheds where the restoration efforts are implemented are to be monitored to determine effectiveness toward improving water quality. Additionally, the County is required to implement restoration for an additional ten percent of the County's impervious surface area. The impervious surface treatment goal has been revised based upon the impervious surface analysis describe above and totals 4,404 acres for the combined previous and current permits. Annual reports are to include the estimated cost and the actual expenditures for program implementation and the monitoring data and surrogate parameter analyses used to determine water quality improvements.

The County reported that its watershed restoration program focuses on three major areas: retrofit projects in partnership with federal and State program initiatives that are supported by grant funding, construction of stormwater management retrofit projects, and public participation projects. As described in the assessment and planning section above, the County's restoration efforts have focused primarily on LID projects.

The status of 28 proposed watershed restoration projects approved under the County's Capital Improvement Program (CIP) was submitted. The projects involved stream restoration, bioretention, stormwater pond water quality retrofit, a trash net, and flood control or storm drainage improvements. When completed, the projects will provide treatment for approximately 349 impervious acres with an estimated cost of \$29.2 million. The impervious area treated is well below the established goal of 4,404 acres.

The County reported that four of the 28 projects are in the planning stage, eight in the design phase, and nine under active construction. The remaining seven projects have been constructed and treat 29.9 acres of impervious surface. The cost for the completed projects total \$7,653,000. Six stream restoration projects were also completed in 2009. These include the Possum Court, Bear Branch, Parkway Drive, Calmos Street, Wynnleigh Road, and Odell Road projects. Impervious area treatment was reported to be 66.7 acres for these projects at a cost of \$2,219,000.

The County's Livable Communities Initiative and CCCP set the framework for a long-term countywide effort to ensure cleaner, more beautiful communities and support activities that improve water quality. To date, the County is unable to quantify the accomplishments of this program relative to impervious area treated and funds expended. However, it is evident that this program has prevented adverse water quality impacts through the removal of potential pollutants. For example, the efforts of more than 16,500 participants have resulted in the collection of 5,174 tons of solid waste, 258 tires, and 156,000 gallons of hazardous wastes at approximately 180 sites. Additionally, 57 vehicles have been towed and 255 tons of electronic devices recycled in 2009.

The County continues to operate end-of-pipe trash nets at the Ray Road and Flagstaff Street outfalls. The Ray Road outfall has a significantly larger drainage area (659 vs. 41 acres) than Flagstaff Street. During 2009, 5,132 and 16,583 tons of material were collected at the respective

sites. The lower amount for Ray Road is due to damage that occurred to the system during June 2009, which limited service dates to three times versus six for Flagstaff Street. Noticeably, service dates are limited to the summer months, which raises the question as to why service is not throughout the year. Based upon the trash monitoring describe above, more than 95 percent of the material collected is described as leafy organic matter. The County reported that the construction cost for both facilities exceeded \$284,000 and annual maintenance costs \$35,000, not including design and repair for the Ray Road system. As a result of costs and continual damage from storms and vandalism, the County reported that it has delayed plans to construct a larger system for a Brier Ditch outfall. The County also maintains mechanical trash screens at the Edmonston, Colmar Manor Bladensburg, and Brentwood pumping stations. During the reporting period, 338 tons of floatables were collected.

Current restoration efforts by Prince George's have failed to meet established goals. Given the current pace of implementation, it is unlikely that future compliance with NPDES watershed restoration goals will be met as well. The County needs to place more emphasis on the implementation of restoration projects.

Assessment of Controls

Prince George's County is required to use chemical, biological, and physical monitoring to document work toward meeting the watershed restoration goal. In April 2007, the County requested to move its watershed restoration assessment monitoring activities from the Beaverdam Creek watershed to the Bear Branch watershed. As part of this change, two in-stream monitoring stations were established instead of the traditional outfall and associated in-stream station. Because dedicated funding has been established and local support for water quality improvement exists in the Bear Branch watershed, MDE supported this request. MDE's approval was contingent upon restoration projects being implemented within the drainage area to the monitoring locations. A detailed restoration implementation schedule and cost estimates were to be submitted. MDE also requested that the relationship between restoration efforts, impervious surface treatment, and water quality improvement be quantified and detailed monitoring site data and drainage area information submitted.

All remaining monitoring requirements remain unchanged (e.g., chemical, biological, and physical protocols). Continuous flow monitoring is required at the in-stream station to develop stage and discharge relationships and pollutant load estimates. For chemical monitoring, at least three discrete samples determined to be representative of each storm event sampled are to be collected and analyzed for 12 specified parameters. The samples collected at the outfall are flow-weighted to better characterize the flashy response of the runoff associated with the highly urbanized drainage area. Twelve storm events are to be monitored each year and baseflow samples are to be taken once per month during periods of extended dry weather.

Bear Branch is a second-order stream with a total drainage area of approximately 1,056 acres at its confluence with Laurel Lake (Station 005). Station 003 is 2,400 feet upstream of station 005. The land use (as of 2000) of the watershed consists of approximately 55 percent forest, 12

percent industrial, 13 percent open space, 7 percent bare land, 5 percent commercial land, and 6 percent residential. Since 2000, there have been many development projects, both residential and commercial, taking place in this watershed. Current impervious cover is 30.5% and is anticipated to be at 37.5% at build out. The stations were set up and chemical monitoring started

in June 2007. However, storm samples were not collected from the time of the installation of the station to the end of September 2007 because of the lack of measurable events.

Eight storm event and seven baseflow samples were collected from October 2008 through September 2009 (i.e., 2009 hydrologic year) at the in-stream stations (003 and 005). Except for the second quarter (January - March 2009), the storm event sampling is fairly represented for each quarter with at least one in each quarter. Sampler mechanical problems during October 2008 and frozen conditions during the second quarter accounted for the reduction in storm event sampling. Sampled storm events ranged in rainfall depths from 0.56 to 1.93 inches. Samples collected were representative of the rising, peak, and falling limbs of each storm's hydrograph. Event mean concentrations (EMCs) were calculated and reported on MDE's Chemical Monitoring Storm Event Database as required. The County reported that there was a higher than expected number on non-detects for nitrate plus nitrite due to "interferences" during laboratory analysis. As a result, EMC values for nitrate plus nitrite were provided using results from the 2008 sampling year. Annual and seasonal pollutant loads were also provided.

Baseline data indicates poor water quality in Bear Branch due to excessive nutrients and suspended sediments. Similarly, several wet-weather samples for total copper, total lead, total zinc, total Kjeldahl nitrogen, and fecal coliform exceed EPA water quality criteria. Dry-weather samples for total Kjeldahl nitrogen and fecal coliform exceeded EPA water quality criteria.

In addition to chemical monitoring, the County is required to conduct biological and physical assessments between the in-stream stations. Macroinvertebrate sampling occurs between the two in-stream stations in the Bear Branch mainstem. The County uses a 20-jab multi-habitat method to collect benthic macroinvertebrate samples along a 100-meter channel reach at each site. Concurrent with the biological sample collection, a qualitative assessment of habitat quality is performed at each site. Ten parameters are evaluated, compared to reference conditions, and assigned a narrative description. Biological monitoring and physical habitat assessment was conducted in the Spring of 2009. Sampling results indicate that the habitat is "partially supporting to supporting." The benthic community was described as being "fair to poor."

For physical assessment, a stream profile and five monumented cross-sections representing 6,312 feet of channel were established in 2007. Measurements and a comparative analysis are to occur annually. The County's geomorphologic characterization includes a Wolman pebble count, a determination of frequent flood and bankfull elevations, a Rosgen Level II classification, and an estimation of bank erosion potential. The physical monitoring data for 2009 indicate no significant change.

As noted above, the County has initiated outreach efforts regarding pet waste management, car washing, fertilizer use, and trash within this watershed. Additionally, the initial "top-ten" priority projects are targeted to address existing erosion sources. Effectiveness of the County's restoration strategy will be gauged by the extent of improved water quality.

Finally, Prince George's County was required to select a watershed to monitor in order to evaluate the effectiveness of stormwater management system implementation for stream channel protection. The County has identified a 1,920 acre drainage area of Black Branch as the watershed for assessment. This watershed was approved for monitoring by MDE in April 2000. The "pre-development" (as of 2000) land use consists of approximately 59 percent agriculture,

35 percent forest, 2 percent commercial land, 1 percent residential, and 1 percent open space. Ongoing development involves a conversion of 40 percent of the watershed (27 percent agriculture and 13 percent forest) to residential land use. Monitoring occurs in the Black Branch mainstem and Tributary 1 (272 acres) where LID practices are to be installed. Development in Tributary 1 will result in approximately 171 agricultural acres being converted to residential land.

During previous reporting periods, approximately 2 miles of stream were surveyed, nine monumented cross-sections were established, and baseline data were obtained for the purposes of evaluating the stream bank protection. Baseline data exhibited high levels of existing problems (e.g., bank instability, disturbed vegetation, extensive sediment deposition, etc.). Current profile and cross-section comparisons are similar to those in previous years and indicate that both stream segments appear to be in transition, with some sites aggrading one year and degrading the next and vice versa. Rosgen Level III data show that the cross-sections are susceptible to bank erosion but are not experiencing significant near-bank shear stresses (NBSSs). The NBSS ratings predict low lateral erosion while incision remains the dominant channel forming process. These results indicated that the stream is still adjusting to the land use alterations resulting from agricultural activities, as well as the more recent development activities at the Oak Creek Club golf course.

The County continues to monitor land use change in the watershed. The County reported that there has been little to no land use change from 2007 to 2009. Additional measurements in the future will determine whether channel alteration continues or stability is obtained.

Prince George's County conducts a noteworthy stormwater monitoring program. Background conditions have been characterized using chemical, biological, and physical monitoring over the past several years. The Bear Branch watershed is targeted for numerous stormwater management retrofit projects. These efforts can be monitored and compared to the well established characterization data. Analyses will improve the understanding of pollutant removal efficiencies associated with watershed restoration activities and the Maryland's 2000 Design Manual.

Program Funding

Prince George's County is required to maintain adequate funding to comply with all conditions of its NPDES stormwater permit. Funding for the County's NPDES program is provided through an ad valorem tax, fee-in-lieu payments, State grants for flood control, contributions from a stormwater enterprise fund, and the sale of stormwater revenue bonds. Prince George's County submitted budget information for its stormwater management enterprise fund and capital improvement program for fiscal years 2002-2009. The budget included current revenue sources (\$58,597,500), operating expenses (\$39,459,000), and capital project expenses (\$17,324,000) for FY 2010. The County's NPDES stormwater funding appears adequate. However, as describe above implementation is lagging. As program implementation accelerates, the County may need to augment existing NPDES funding and support needs.

Summary

Prince George's County has implemented many of the program components required by its NPDES permit. Ongoing watershed assessment and planning efforts remain strong and the County should have the ability to link potential sources of pollution with activities within its

watersheds. Public participation and outreach efforts continue to excel. Most noticeably, source identification data reporting has improved and private stormwater facility maintenance inspections have been initiated during the reporting term.

However, other stormwater programs lag and need increased attention and resources. Erosion and sediment control program deficiencies remain and restoration efforts have fallen well short of established impervious surface treatment goals. These shortcomings are clear violations of permit conditions. Improvements are also needed regarding outfall screening and routine surveying of commercial and industrial areas.